(ENVS Logos thru time by former ENVS students Shannon Seifert and Jon Bowers)

Program Assessment Plan

Bachelor of Science in Environmental Science

University of Alaska Southeast

Program Faculty April 1, 2011

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April 1, 2011

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I. Degree Title

Bachelor of Science in Environmental Science, University of Alaska Southeast

II. Student Assessment

A. Student Learning Goals

The Environmental Science Faculty have worked together to develop The Bachelor of Science in Environmental Science (ENVS) curriculum at the University of Alaska Southeast. By taking advantage of Juneau's natural surroundings, the ENVS Program provides research and field work-centered learning to prepare our graduates for career success.

The main objective of the Environmental Science degree program is to produce graduates who are well educated in the processes and interactions that occur in and between the atmosphere, biosphere, lithosphere, and hydrosphere. To achieve this, the curriculum draws from a number of disciplines. Students have the opportunity to be trained in basic mathematical and scientific methods and the application of these methods in the examination of the relationships between natural processes and human endeavors. ENVS students can also earn a minor in Biology or Mathematics. This is especially desirable for students interested in becoming secondary science teachers or considering graduate school. An ENVS minor is also offered by the department and is targeted at non-ENVS majors who wish to begin to develop an acquaintance with Earth Systems science, expand their awareness of human impacts to these systems, and receive recognition on their transcripts for their efforts. The Environmental Science Program has four goals. These are to produce graduates who have learned:

Goal 1. A Core Knowledge of Earth Systems.

Goal 2. Use of Technology to collect and evaluate scientific data.

Goal 3. Application of Scientific Knowledge towards solving environmental problems with anthropogenic origins.

Goal 4. An achievement of Knowledge, Skills, and a level of Professionalism necessary to obtain living wage levels of employment or entry into graduate school.

B. Student Outcomes

Goal 1. The graduate will acquire a Core Knowledge of Earth Systems.

Outcome 1. Success in required courses linked to each of earth systems (knowledge)

i. **Atmosphere:** ENVS 101, ENVS 338, ENVS 403, ENVS 409, ENVS 420, CHEM 105, 106, 350, PHYS (103-104, or 211-212) courses, and MATH 201.

ii. **Biosphere:** ENVS 101, ENVS 110, ENVS111, ENVS 338, ENVS 309, ENVS 403, ENVS 408, ENVS 409, ENVS 410, ENVS 415, BIOL 105, BIOL 271, CHEM 105, 106, & CHEM 341.

iii. **Hydrosphere:** ENVS 101, ENVS 110, ENVS 111, ENVS 309, ENVS 338, ENVS 407, ENVS 409, ENVS 410, GEOL 301, GEOL 302, GEOL 310, GEOL 315, MATH 201, CHEM 350, & Juneau Icefield Research Program Summer Semester Field Glaciology Camp in cooperation with the Foundation for Glacier and Environmental Research.

iv. **Lithosphere:** ENVS 110, ENVS 111, ENVS 309, ENVS 338, ENVS 403, ENVS 409, ENVS 410, ENVS 415, GEOL 104, GEOL 271, GEOL 300, GEOL 301, MATH 201, & CHEM 350.

Assessment of success of deliverance of core knowledge will be determined in the ENVS seminars (capstone courses), which are required of all majors. These capstone courses will evaluate the student's senior-level ability to carry out research which is a demonstration of core knowledge in science.

Goal 2. The graduate will demonstrate use of Technology to collect and evaluate scientific data.

Outcome 1. The graduate will develop formative technological and quantitative skills (data loggers, GPS software and receivers, and other analytical skills of measurement technique) introduced in required courses and honed during ENVS 498 Independent Research or ENVS 491 Internship Experiences. Completion of this goal is evidence of the acquisition of knowledge and skills in the discipline.

Outcome 2. The graduate will demonstrate cumulative technological and quantitative skills (use of mathematics in the applications of data spreadsheets, database management, statistical analysis, and GIS software, data analysis) introduced in required courses and honed during ENVS 498 Independent Research or ENVS 491 Internship Experiences. Completion of this goal is evidence of the acquisition of knowledge and skills in the discipline.

Goal 3. The graduate will understand the Application of Scientific Knowledge towards solving societal problems.

Outcome 1. The graduate will demonstrate writing, information literacy, and communication skills through required core courses with semester-scale class projects including websites, research papers, and presentations (ENVS 101, GEOL 271, GEOL 301, GEOL 302, ENVS 338, ENVS 420, and capstone courses senior seminar ENVS 491, 492, or 498).

Outcome 2. The graduate will develop research and workplace skills in ENVS 491 Seminar, 498 Independent Research, or ENVS 491 Internship. These skills are necessary for the workforce ranging from Environmental Impact Statement (EIS) document preparation to research paper production and publication, to oral presentations for local,

regional, and national audiences. Completion of this goal is evidence of the acquisition of knowledge, skills, and professionalism in the ENVS disciplines.

Goal 4. The graduate will demonstrate achievement of Knowledge, Skills, and a level of Professionalism necessary to obtain living wage levels of employment or entry into graduate school.

Outcome 1. The graduate will demonstrate development and mastery of analytical and critical thinking skills that enable conceptualizing, synthesizing, evaluation of information from the environment, and the application and dissemination of this information for the resolution of societal conflicts with natural systems. Such skills, are evaluated in developmental courses (ENVS 101, PHYS (103-104 or 211-212), GEOL 271, CHEM 105-106, BIOL 105, upper division courses (GEOL 301, GEOL 302, ENVS 338 ENVS 420, CHEM 341 or 350), and capstone courses (ENVS 491, 492 or 498) and are desirable for success and productivity in the workplace. Completion of these goals is evidence of the acquisition of knowledge, skills, and professionalism in the discipline.

Outcome 2. The graduate will demonstrate development and mastery of the communication and writing skills that enable conceptualizing, synthesizing and evaluation of information from the environment necessary for the application and dissemination of this information for the resolution of societal conflicts with natural systems. Such fully matured skills, evaluated in capstone courses ENVS 491, 492, or 498, and should enhance our graduates, abilities to earn a living wage. Completion of this goal is evidence of the acquisition of knowledge, skills, and professionalism in the discipline.

C. UAS Competencies

The following competencies will be integrated into the program through achievement of the student learning goals as follows:

	Goal 1.	Goal 2.	Goal 3.	Goal 4.
Communication	X	X	X	X
Quantitative Skills	X	X	X	X
Information Literacy	X	X	X	X
Computer Literacy	X	X	X	X
Professional Behavior	X	X	X	X
Critical Thinking	X	X	X	X

III. Curriculum Map

The Environmental Science faculty has worked together and agrees that the following goals and competencies are introduced, developed and mastered at the following points in the program:

A. ENVS Program Student Assessment Check Points

Knowledge Areas Emphasized	Lower Division		Level	UAS Competencies	Goals
A,B,H,L	ENVS 101	Lower Division Library Research Paper-web Format	**Introduce**	**C,Q,IF,CU,PB,CT**	**All**
A,B,H,L	CHEM 105,106	Lab Reports	**Introduce**	**Q,IF,CU,T**	**All**
A,B,H,L	PHYS courses	Uploadable Physics lab	**Introduce**	**Q,IF,CU,T**	**All**
A,H,L	GEOL 104	Field Lab Data and GeoEngineering Report	**Introduce**	**C,Q,IF,CU,PB,CT**	**All**
A,H,L	GEOL 271	Minerals and Society Research Paper-web format	**Develop**	**C,Q,IF,CU,PB,CT**	**All**
	Upper Division			**C,Q,IF,CU,PB,CT**	**All**
A,H,L	GEOL 301	Landscape Evaluations of National Parks in Alaska Research Paper	**Develop**	**C,Q,IF,CU,PB,CT**	**All**
H	GEOL 302	Hydro Lab or UD research paper	**Develop**	**C,Q,IF,CU,PB,CT**	**All**
B,H, L	ENVS 338	GIS Map Project	**Develop**	**C,Q,IF,CU,PB,CT**	**All**
A,H,L	ENVS 420	Climate Model Project	**Mastery of Skills**	**C,Q,IF,CU,PB,CT**	**All**
A,B,H,L	CHEM 341 or	Lab Analysis Project	**Mastery of Skills**	**C,Q,IF,CU,PB,CT**	**All**
A,B,H,L	CHEM 350	Lab Analysis Project	**Mastery of Skills**	**C,Q,IF,CU,PB,CT**	
	Capstones	**Mastery of Knowledge, Skills, Professionalism**		**UAS Competencies**	
	ENVS 492	Polish final exit CV, UD Research Papers and datasets from required courses for future employment interviews or graduate school.	C	Communication	**All**
	ENVS 491	Documentation of Internship experience including proposal, log of activities, final report on experience, Faculty advisor & Mentor evaluation	Q	Quantitative Information	**All**
	or		IF	Literacy	
	ENVS 498	Documentation of Research, Field notebooks, data, lab logs, draft research paper or abstract for poster to be presented at scientific meeting.	CU	Computer Usage	**All**
			PB	Professional Behavior	
			CT	Critical Thinking	

		Level of Competency	
A	Atmosphere		
B	Biosphere	Introduce	Lower Division (100-200 level)
H	Hydrosphere	Develop	Next level of expectations (200-300 level)
L	Lithosphere	Master	"Master" at an UD undergraduate level (UD 300-400 level)

B. Syllabi: Sample program syllabi which indicate where program goals are mapped are attached in Appendix A.

IV. Program Assessment Methods and Measures

Student Assessment

A. Capstone Course(s)

ENVS 492 (Environmental Science Seminar), and ENVS 491 (Environmental Science Internship) or ENVS 498 (Research in Environmental Science) are the capstone courses offered to students by the Environmental Science departmental faculty. All program students must take ENVS 492, and may take either ENVS 491 or ENVS 498.

ENVS 491 Environmental Science Seminar 3 credits

Current topics in environmental science. Preparation of written reports on selected topics and oral presentations.

ENVS 492 Environmental Science Internship 1-4 credits

Part-time work in an approved science agency or natural resource based industry. The student is to be supervised by a senior employee of the agency in cooperation with the faculty advisor.

ENVS/GEOL 498 Research in Environmental Science or Geology 1-6 credits

Individual research in the environmental science or geology, undertaken by a student in consultation with a member of the Environmental Science faculty. Students may submit research ideas to faculty and develop them into a project with faculty input. Requires consent of advisor and appropriate faculty sponsor.

B. Rubric – Student Levels of Proficiency

Use of this rubric will enable the ENVS faculty to effectively aggregate and summarize student data in regard to student learning goals and outcomes.

Overall Rating Scale:

Exceeds Expectations 1 = exemplary performance

Exceeds Expectations 2 = surpasses the standards and performance expectations

Meets Expectations 3 = very good performance; consistently meets standards and performance expectations

Meets Expectations 4 = good performance; generally meets standards and performance expectations

Does not meet expectations 5 = performance does not meet expectations; below expected levels; improvement needed

Does not meet expectations 6 = performance falls below expectations; substantial improvement critical

Goal 1. The graduate will acquire a Core Knowledge of Earth Systems.

	Exceeds Expectations	Meets Expectations	Does Not Meet Expectations
	1 2	3 4	5 6
Outcome 1. Success in required courses linked to each of earth systems (knowledge) i. Atmosphere	Student receives an A or B grade in ENVS 101, CHEM 105, and CHEM 106	Student receives a C grade in ENVS 101, CHEM 105, and CHEM 106	Student receives a D or F grade in ENVS 101, CHEM 105, and CHEM 106
Outcome 1. Success in required courses linked to each of earth systems (knowledge) ii. Biosphere	Student receives an A or B grade in PHYS (103-104 or 111-112) and ENVS 420	Student receives an C grade in PHYS (103-104 or 111-112) and ENVS 420	Student receives an D or F grade in PHYS (103-104 or 111-112) and ENVS 420
Outcome 1. Success in required courses linked to each of earth systems (knowledge) iii. Hydrosphere	Student receives an A or B grade in BIOL 105 or BIOL 271 or CHEM 341 and ENVS 309	Student receives an C grade in BIOL 105 or BIOL 271 or CHEM 341 and ENVS 309	Student receives an D or F grade in BIOL 105 or BIOL 271 or CHEM 341 and ENVS 309
Outcome 1. Success in required courses linked to earth's hydrological systems (knowledge) iv. Lithosphere	Student receives an A or B grade in GEOL 302 or CHEM 350	Student receives an C grade in GEOL 302 or CHEM 350	Student receives an D or F grade in GEOL 302 or CHEM 350
Outcome 1. Success in required courses linked to solid earth and surface landscapes	Student receives an A or B grade in GEOL 104 and GEOL 301	Student receives a C grade in GEOL 104 and GEOL 301	Student receives a D or F grade in GEOL 104 and GEOL 301

Goal 2. The graduate will demonstrate use of Technology to collect and evaluate scientific data.

	Exceeds Expectations	Meets Expectations	Does Not Meet Expectations
-	1 2	3 4	5 6
Outcome 1. The graduate will develop formative technological and quantitative skills (data loggers, GPS software and receivers, and other analytical skills of measurement technique).	Student receives an A or B grade in ENVS 338 MATH 200-201	Student receives an C grade in ENVS 338 MATH 200-201	Student receives a D or F grade in ENVS 338 MATH 200-201
Outcome 2. The graduate will demonstrate cumulative technological and quantitative skills in capstone experiences	Student receives an A or B grade in ENVS 491 or 498	Student receives an C grade in ENVS 491or 498	Student receives a D or F grade in ENVS 491or 498

Goal 3. The graduate will understand the Application of Scientific Knowledge towards solving societal problems.

	Exceeds Expectations	Meets Expectations	Does Not Meet Expectations
	1 2	3 4	5 6
Outcome 1. The graduate will demonstrate writing, information literacy, and communication skills acquired through semester scale class projects requiring research papers and presentations. (ENVS 101, GEOL 271, GEOL 301, GEOL 302, ENVS 310, ENVS 420, culminating in the capstone courses senior seminar ENVS 492.	Student receives an A or B grade in ENVS 492 or through presentation at a scientific meeting off-campus	Student receives an A or B grade or through presentation at a scientific meeting off-campus n ENVS 492	Student receives an A or B grade in or through presentation at a scientific meeting off-campus ENVS 492

Outcome 2. The graduate will develop research and workplace skills in ENVS Independent Research ENVS 498 or ENVS Internship ENVS 491 necessary for workforce ranging from EIS document preparation to research paper publication to oral presentations for local, regional, and national audiences. Completion of this goal is evidence of the acquisition of knowledge, skills, and professionalism in the discipline.	Student receives an A or B grade in ENVS 491 or 498	Student receives an C grade in ENVS 491or 498	Student receives a D or F grade in ENVS 491or 498

V. Assessment Cycle

A. Schedule:

At the first departmental meeting of each year held during UAS fall convocation the faculty of the Environmental Science Department will conduct an annual analysis of data collected. In addition, programmatic issues that arise during the year will be addressed as necessary, and incorporated into the annual analysis.

B. Procedures:

Data collected on program graduates from annual and ongoing assessment activity:

1) Capstone Courses (ENVS 491, 492, 498)

2) Student Level of Proficiency Rubric

These metrics will be used to assess program effectiveness and to suggest curricular revisions to the Environmental Sciences degree program.

C. Responsibility:

The Environmental Science Program Coordinator will be the person designated to oversee assessment activity, including data collection and analysis. The Program Coordinator will report back to the Environmental Science faculty the results of data analysis at the annual departmental meeting held during UAS fall convocation.

D. Timeline: During the first cycle of assessment, the first goal and goal outcomes will be assessed:

Goal 1. The graduate will acquire a Core Knowledge of Earth Systems.

Outcome 1. Success in required courses linked to each of earth systems (knowledge)

i. **Atmosphere:** ENVS 101, CHEM 105,106, 350, PHYS 103-104 or 111-112, MATH 200-201, ENVS 420, CHEM 350
ii. **Biosphere:** ENVS 101, BIOL 105, CHEM 105,106, CHEM 341, ENVS 310
iii. **Hydrosphere:** ENVS 101 PHYS 103-104, or 211-212, MATH 200-201, GEOL 302, CHEM 350
iv. **Lithosphere:** GEOL 104, GEOL 271, GEOL 301, MATH 200-201, ENVS 310

During the second assessment cycle, the first and second goal and goal outcomes will be assessed:

Goal 2. The graduate will demonstrate use of Technology to collect and evaluate scientific data.

Outcome 1. Formative and cumulative technological and quantitative skills (use of mathematics in the applications of data spreadsheets, data loggers, database management, statistical analysis, GIS software, GPS software and receivers, and data analysis) introduced in required courses and honed during ENVS/GEOL 498 Independent Research or ENVS 491 Internship Experiences. Completion of this goal is evidence of the acquisition of knowledge and skills in the discipline.

During the third assessment cycle, the first, second and third goal outcomes will be assessed:

Goal 3. The graduate will understand the Application of Scientific Knowledge towards solving societal problems

Outcome 1. The graduate will demonstrate writing, information literacy, and communication skills through semester scale class projects requiring research papers and presentations culminating in final projects in capstone courses senior seminar ENVS 492, ENVS 491 or ENVS 498.

Outcome 2. The graduate will develop research and workplace skills in Independent Research (ENVS/GEOL 498) or Internship (ENVS 491) necessary for workforce ranging from EIS document preparation to research paper publication to oral presentations for local, regional, and national audiences. Completion of this goal is evidence of the acquisition of knowledge, skills, and

Appendix A: Syllabus for ENVS 101-Introduction to Environmental Science

Introduction to Environmental Science

ENVS 101 – Fall 2010

Syllabus

Lectures MWF 12:00 to 1pm Lower Hendrickson Building 110
Course Instructors:
Eran Hood
Office: Soboleff Annex 102 Phone: 907 796-6244
Email: eran.hood@uas.alaska.edu
Office Hrs: Wed 1-2 pm; Thurs 11 am-noon, or by appt.
Cathy Connor
Office: Soboleff Annex 106 **Phone: 907 796-6293**
Email: cathy.connor@uas.alaska.edu
Office Hrs: TBA

Labs THURSDAYS (J01 9am-noon, J02 1:15-4:15pm)
Lower Hendrickson Building 110
Lab Instructor: Michael Hekkers
Office HB 107 **Phone: 907 796-6523**
Email: mlhekkers@uas.alaska.edu
Office Hrs: Mon, Tue 11am-noon or by appointment

Text: *Physical Geography: Science and Systems of the Human Environment*. By: A.Strahler and A.Strahler.
3rd Edition, 2005. Publishers: John Wiley & Sons, Inc. New York. pp. 794.
& Supplies: Calculator (e.g. Math courses use TI-82)
Write-in-the-rain book for field notes
Loose-leaf binder for lab materials
Rubber boots and clothing suitable for coastal rainforest weather.

Objective: This course examines the atmospheric, hydrospheric, lithospheric, and oceanic systems that define our environment, the interactions among these systems, and the quantitative methods used in environmental science. The lab focuses on measurements and descriptions of environmental parameters from meteorology, climatology, hydrology, and geomorphology using relevant field methods.

Prerequisite: Math 105, Intermediate Algebra, co-requisite for ENVS 101

Evaluation:	60% Coursework, 40% Quizzes & Exams
Coursework	Labs and Exercises (35%)
	Web Term Project (20%)
	In-Class Writings and Participation (5%)
Examinations	2 Midterm Examinations (20%)
	Final Examination (20%)

Means of Assessment

Examinations, exercises, lab activities, reports, and presentations will be used to assess achievement in this course. Competencies emphasized in ENVS 101 include: Data collection, manipulation, and analysis; written and oral communication; and instrumentation and technology.

Student Responsibilities

Students are expected to read the text and library reserve materials; attend all classes and labs; take exams and submit assignments at designated times; learn software and technology pertinent to the course; and to participate in class discussions.

Grades:

Letter grades are based on the following scale**:**

90 – 100%	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
0 - 59 %	F

Note: plusses and minuses will be given at the discretion of the instructor

Class Outline: TENTATIVE

Note: There will be no lab on 9/2

Week		Topic	Text
1	Class (9/3-	Class Expectations	Chapter 1-3

	9/10)	Planet Earth and Maps (Hood)	
	Lab (9/9)	Mendenhall Watershed System/Maps (Field)	
2	Class (9/13-9/17)	Global Seasons and Energy System (Hood)	Chapter 4
	Lab (9/16)	GPS (Field – on campus)	
3	Class (9/20-9/24)	Atmospheric Structure and Temperature (Hood)	Chapter 5
	Lab (9/23)	Energy Balance of Auke Lake (Field – on campus)	
4	Class (9/27-10/1)	Atmospheric Moisture and Precipitation (Hood)	Chapter 6
	Lab (9/30)	Atmospheric Lapse Rates (Field – Mt Roberts Tram)	
5	Class (10/4-10/8)	Wind and Global Circulation (Hood)	Chapter 7
	Lab (10/7)	GIS (on campus)	
		Web Project Proposal due Oct 8	
6	Class (10/11-10/15)	Weather Systems (Hood)	Chapter 8
	Lab (10/14)	Field Trip to National Weather Service office	
		Midterm Exam I – Oct 13	
7	Class (10/18-10/22)	Earth Materials, Tectonics and Structure (Connor)	Chapter 12-13
	Lab (10/14)	**Webpages/Term project (in lab)**	
8	Class (10/25-10/29)	Volcanoes and Earthquakes/ Weathering (Connor)	Chapter 14-15
	Lab (10/28)	**Plate Tectonics (in lab)**	
9	Class (11/1-	Water Cycle (Hood)	Chapter 16

	11/5)		
	Lab (11/4)	**Streamflow (field)**	
10	Class (11/8-11/12)	Surface and Groundwater (Hood)	
	Lab (11/11)	**Glacier effects and properties (in lab)**	
		Midterm Exam II – Nov 10	
11	Class (11/15-11/19)	Fluvial Processes and Landforms (Connor)	Chapter 17
	Lab (11/18)	**Coastal Geomorphology Lab**	
12	Class (11/22-11/24)	Wind and Waves (Connor)	Chapter 19
	No Lab	Work on Web Term Projects	
13	Class (11/29-12/3)	Glacial Systems (Hood)	Chapter 20
	Lab (12/2)	Student Webpage Presentations	
14	**Class (12/6-12/10)**	Soils and Climate Change in Alaska (Hood and Connor)	Chapter 21 and TBA
	Lab (12/9)	Final Exam Review	
		Final Exam – TBA	

Coursework:

Lab Notebooks

Careful note taking is an important part of any scientific endeavor. Lab notebooks provide an opportunity to develop note-taking skills and provide a coherent set of notes to which the student can refer as a reference for later work in environmental science. The organization and contents are the choice of the student. Never, change recorded values for data or results--always retain the original data recordings and any instrument settings. The expectations for individual lab write-ups will vary and will be introduced with the labs.

Exercises
Occasionally, exercises will be assigned. These will be computations based on topics in the lectures or reading, responses to library or internet materials, and brief reports on topics that arise in discussion. Exercises will be graded separately, but may be added to lab notebooks

Web Term Project
Each student will develop a webpage related to a current research topic in environmental science. This assignment will provide you with the opportunity to explore a topic that we may not have time to cover in class. During the semester each student will prepare a webpage with the following elements:

- Summary/overview of the research
- Relevance of the research
- What questions the research brings to mind
- Ways you can think of for answering those questions

Examinations:
There will be two midterm exams and a final exam. All exams will consist of:
- Short responses to factual material covered in lectures, discussions, and the reading
- Short calculations
- A longer, reasoned response to an essay topic.

Plagiarism
Plagiarism will not be tolerated in this class. If you have any question about what constitutes plagiarism, please talk to me or look at the references available through the Egan Library website:
http://www.uas.alaska.edu/library/students/index.html
(See the plagiarism prevention resources at the bottom of the page).

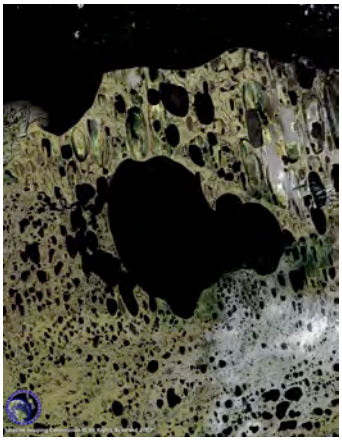
Jan-11-11

GEOLOGY 301 Geomorphology

Menan Buttes Idaho
http://earthobservatory.nasa.gov/images/imagerecords/48000/48097/menanbuttes_ali_2010268_lrg.jpg

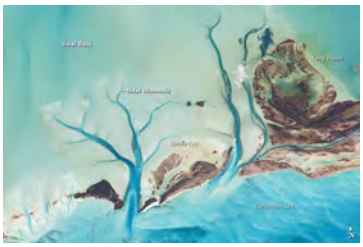
Denali North America's tallest Peak

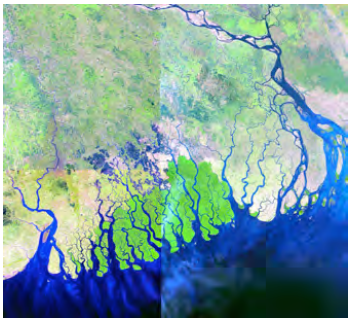
Mt Reboubt Ash Cook Inlet, AK Jan 2009 AVO Photo



Thermokarst Lakes in Permafrost North slope AK

Tidal Flats and Channels, Long Island, Bahamas
http://earthobservatory.nasa.gov/images/imagerecords/48000/48159/ISS026-E-005121_lrg.jpg





Ganges-Brahmaputra River Delta/Bangladesh

UAS Spring Semester-2011 (Course Reference Number=37781)
4 credit course with lab, required course for ENVS and Geography majors

Instructor: Cathy L. Connor, PhD,
Professor of Geology, Department of Natural Sciences
Environmental Science & Geography Programs
on the north/Auke Lakeside of the Soboleff Building.
Phone: (907) 796-6293 Office Hours: Wed 10 am -1pm, Thursday 12-3 pm
email: CLCONNOR@uas.alaska.edu

Webpages: www.uas.alaska.edu/envs/faculty
http://www.uas.alaska.edu/pub/CLCONNOR

Class Meetings Times

Lecture: T-TH 9:45-11:15 pm HB 113 Tuesday, HB 110 Thursday
Lab: Weds 1-4 pm HB 110

TEXTBOOK: (REQUIRED)
Process Geomorphology 4th Edition Dale F. Ritter, R. Craig Kochel, & Jerry R. Miller ----McGraw Hill ISBN 0-697-32211-8

Auxiliary Text & Lab Materials

Download **GOOGLE Earth 6.0** onto your personal laptop.
http://www.google.com/earth/index.html
This will be an important tool for us this semester

**Active Tectonics: Earthquakes, Uplift, and Landscape* Keller and Pinter
**Atlas of Stereoscopic and Aerial Photographs and Remote Sensing Imagery of North America*-Hamblin
(*Connor will provide copies for student use in class)

UAS EGAN Library Geomorphology Journals

Geological Society of America
- Geology
- Geological Society of America Bulletin

Science Direct: Online Journals from Elsevier
(Full text—pdfs and hypertext linked word files)
- Geomorphology
- Quaternary Science
- Quaternary Science Reviews
- Journal of Antarctic, Arctic, and Alpine Research

Capital City Library Card-to use the materials in the Egan library (databases, reserve books, or to order and receive inter-library loan materials online).

Useful GEOMORPHOLOGY WEB LINKS

Google Directory
http://www.google.com/Top/Science/Earth_Sciences/Geology/Geomorphology/

Simon Frasier University:British Columbia
http://www.sfu.ca/personal/tabrenna/links.htm
http://web.unbc.ca/~menounos/GEOG311/Geomorphology_Links.html
University British Columbia: Vancouver BC)
http://www.uwsp.edu/geo/internet/physical_geog_resources.html#geomorph
Planetary Society
http://www.planetary.org/blog/article/00002855/
Alaska Quaternary Center http://www.uaf.edu/aqc
University Washington Quaternary Center http://depts.washington.edu/qrc
Prof. William Dietrich-U.C. Berkeley, CA Geomorphology
http://eps.berkeley.edu/development/view_person.php?uid=1164&page=81
Profs. Robert and Susan Anderson-UC-Boulder, CO Geomorpholog
http://instaar.colorado.edu/~andersrs/

Why Take a Geomorphology Course?

Landform evolution is an important discipline in the Earth sciences and involves the complicated interactions, over thousands to million year timescales, between different physical processes and environmental factors, such as underlying rock structures, tectonics, rock types, climate and climatic changes. Over the past 8,000 years or so, human activities, have transformed the Earth's surface through agriculture, mining and urbanization. Understanding and deconstructing the complexity of these processes on spatial and temporal scales will be part of our challenge this semester. http://www.niu.edu/landform/home.html.

Real-time monitoring of changes to Earth's surface is now possible through sensor arrays and models that can aid in the prediction of natural hazards (such as landslides, avalanches, flooding, volcanic eruptions, tsunami, etc). This information is becoming increasingly important for evaluation of ecosystem impacts and for intensely urbanized human environments with high use transportation networks. All "Earthlings" should have a basic understanding of how our planet's surface processes and environmental factors affect the landscapes they live upon and how they are different from other terrestrial planets like Mercury, Venus, and Mars.

Increasing rates of change and the ability to adapt to this change will provide the greatest challenges for 7 billion people in 2011 (6,752,542,538

in Spring Semester 2009, up by 247,457,462!) and uncounted plant and animal species living on Earth. 21st century humans now act as a geologic force on the planet, by moving billions of tons of soil and rock each year through our agriculture, road building, mining, and construction practices more sediment annually than all of the world's rivers. Much topsoil that is washed into river systems is lost to us until the next viable topsoil can regenerate in 250 or 500 years depending on climate.

Required Lab/Field Materials

Digital Camera, (can check out from Mike Hekkers in HB 107 or UAS media services), Rite in the Rain TM Yellow Notebook, scientific calculator (exponents, trig functions, logarithms, statistics), Many of our labs sessions will be field based as we familiarize ourselves with local landforms. Appropriate field clothing (i.e. wool or polar fleece sweater, waterproof raingear, hats, mittens, long underwear and snow or rain boots) may be needed depending on the scheduled event. The Tongass can be soggy and cold in the winter and you need to be mostly warm and water-proof during lab exercises.

UAS E-PORTFOLIO: Submitting your weekly assignments electronically (REQUIRED)

All GEOL 301 students will post their assignments electronically online and on time, using the UAS e-portfolio system. See web instructions below for instructions. Make certain the email listed on your UAS portfolio is one you check regularly. If not please upgrade it.
http://www.uas.alaska.edu/helpdesk/faq/ePortfolio-FAQ.html

Your UASHome space:
http://www.uas.alaska.edu/helpdesk/coursework/uasHome.html
Your UAS student ID will give you access to our classroom/lab computers. You may store your work on your UASHome (computer storage space). One of the goals for this course is to improve your information literacy, ability to search for specific information and to articulate what you find into coherent written and oral form.

DOING THE WORK

The science of geomorphology is best learned and most meaningful when you personally interact with actual earth processes in a natural setting. This will

help you to improve your science literacy and your ecosystems ethos as a citizen of the US and the world.

Throughout the semester we will spend some of our lab time in HB 110 learning the language of this science. Other lab times will be spent at various sites around Juneau learning to read the landscape story in rocks, minerals, sediment, and surface features by collecting geologic information directly. Your understanding of your planet's processes will slowly be realized through your own field observations linked with your acquaintance your textbook and with the published Earth science literature. You will also learn from hand specimens of minerals and rocks, maps & satellite imagery, local outcrops, beaches, glaciers, and mountain ranges, to polish up your understanding of Earth's surface systems. **Your weekly lab activities and assignments constitute a significant percentage of your total course grade.**

Physical disabilities

Some of our fieldwork may involve walking for portions of the lab period (East Glacier Trail is an example) or working outside in cold, wet, damp, or windy conditions. If you have any physical disabilities or health problems that will make it difficult for you to participate in field work, please let me know in your responses to the student information questions and I will figure out how to accommodate you.

Instructor Expectations

My objectives for this course are to expose you to the discipline that is landscape science and to give you a useful understanding of your planet's interlinkage between surface climate and tectonic processes. My desired outcomes for you in this course include the hope that you will each add an "Earth surface process knowledge layer" to your existing mental framework of scientific understanding and that you will continue to develop a deepening awe about how planets work and why ours is worthy of our care and attention. I expect you to come to all classes and labs prepared for the topic of the day, do the work assigned, turn it in when it is due, and bring and share your own experiences into each session so we can all learn from each other in a much richer environment. In short, the usual "best practices by college professors type stuff".

GEOL 301 Student Responsibilities:

Students are expected to come to class on time and be prepared for each lecture session by reading the text and required readings **before hand.** Students will attend all labs, submit assignments at designated times, learn to use software, computer data storage and transfer, and other technologies pertinent to this course. Participation in course discussions and generation of original thoughts will be encouraged.

Doing The Work

1- mid-term exam @ **100 points (10%)**
10-Laboratory Exercises @ 40 points
each.....**400 points (40%)**
4 Gigapan-GOOGLE Earth & GIS Landscape
characterization Vignettes...**200 points (20%)**
1-Alaskan Landscape Final Project.....**300 points (30%)**
Geomorphic characterization of a selected AK landscape
Slope, fluvial, glacial, tectonic surface geomorphology.
Records of past climates in the landscape
Total Points=1000 points

Points accrued by student out of 1000 possible will determine your grade.
A=100-90%, B=89-80%, C=79- 70%, D=69-60%, F<60%

COURSE SCHEDULE- GEOL 301 Spring 2011

This spring there will be at least one public lecture pertinent to GEOL 301 on Friday Eve March 4, 2011. Fireside Chats US Forest Service Mendenhall Visitor Center Friday Eves 6:30 and 8 pm see flier in resources section
http://www.fs.fed.us/r10/tongass/districts/mendenhall/firesides.html

Week 1
Tues-Thurs 1/11-13 Chap 1-Introducing Process Geomorphology
Wed Lab 1-Landscape Analysis Stereo Imagery

Week 2
Tues-Thurs 1/18-20 Chap 2-Internal Forces and Climate

Active tectonics and Warming surface Temperatures
Wed 1/19 Lab-2 –Landscape Analysis Deserts to Icefields
-Identify Landscape Vignette #1

Week 3
Tues-Thurs 1/24-26 Chap 3-Chemical Weathering and Soils
Wed Jan 25 Lab-3 Tombstone Change through Time
Meet Downtown in Evergreen Cemetery on Glacier Ave across from Harborview/Marie Drake Middle school. Capitol Building, SOB, New Parking Garage

Week 4
Tues-Thurs 2/1-3 Chap 4 Physical Weathering Mass Movement and Slopes
Wed 2/2 Lab 4- Lab 4-Avalanche and Landslide Tour De Juneau
Logistics TBA
Identify Landscape Vignette #2

Week 5
Tues-Thurs 2/8-10 Chap 5-Drainage Basin – Development, Morphometry, and Hydrology
Wed 2/9 **Lab 5** Yukon,Taku, and other interesting watersheds

Week 6
Tues-Thurs 2/15-17 Chap 6 Fluvial Processes
Oxbow---Landsat, CBJ LIDAR, & SPOT imagery
Wed 2/16 **Lab 6- Part 1**-Mendenhall River Hydrology and Geomorphology
Logistics TBA
Identify Landscape Vignette #3

Week 7
Tues-Thurs 2/22-24 Review for **in class Midterm on Thursday 2/23**
Lab 6-2/23 Mendenhall River **Part 2** Work up data collected from previous week

Week 8
Tues-Thurs 3/1-3 Chap 7-Fluvial Landforms

Lab-7 Bowen Images of Alaska and GIS-DEM work
Indentify Landscape Vignette #4

Week 9 SPRING BREAK MARCH 7-12th
No Class or Lab---- use your free time to REGROUP!

Week 10
Tues-Thurs 3/15-17 Chap 13 Coastal Processes and Landforms
Disappearing Nations and drowning shorelines
Wed **Lab 8**-3/16-A visit to an interesting local Coastal Landform area

Week 11
Tues-Thurs 3/22-24 Chap 9- Chap 10- Glacier Mechanics and Glacier Landscapes Active Tectonics and Northern Southeast Climate History
Wed **Lab 9** 3/23 Southern Alaska and Juneau Icefield Glaciers
Uplift Follows Deglaciation

Week 12
Tues-Thurs 3/29-31 Chap 12-Karst Processes and Landscapes
Wed LAST Lab 10 to write up 3/20--Kentucky, Prince of Wales Island, Wrangell St. Elias NP, and the Nullabar Plain Australia Karst landscapes

Week 14
Tues-Thurs 4/5-7 Tues-Thurs 4/12-14 Chaps 8 Deserts Landscapes---Changing Climates Africa, Australia, Asia, and Alaska
Wed **Lab 10** 4/6 Juneau Glacier Sediments and landforms in the field
Tour De Juneau Quaternary Sediments MT Creek Gastineau Channel Formation and Mt Edgecumbe Ash

Week 13
Tues-Thurs 4/12-14 Chap 11-Periglacial Landscapes in a Warming climate
Wed 4/13 **Lab work on your AK Landscape Project**

Week 15
Tues-Thurs 4/19-21 Volcanic Processes and Landforms on Earth and off Earth: Mars, Io, the Moon, and Alaskan volcanic landscapes. What do they

reveal about subsurface tectonics? The Northern Cordilleran Volcanic Province
Wed 4/20-**Lab work on your AK Landscape Project**

Week 16 Finals Week
April 25-29
Wrapping it Up Students Landscape Presentations
Turn in Research Papers by 04/29/2011 by 5 pm.

UAS Juneau Campus Graduation is Sunday May 01, 2011

Appendix C-Syllabus for ENVS 492 Environmental Science Seminar Spring 2011

SYLLABUS: ENVIRONMENTAL SCIENCE SEMINAR (ENVS 492) – Spring 2011

Instructor

Mike Hekkers
Email: mlhekkers@uas.alaska.edu
Office Hours: M 11:00-12:00 or by appointment Hendrickson Building 107
Phone: 796-6523

Class Meeting

Wed, 12:00-1:00pm, HB 105

Readings

There is no required text for this class. There will be weekly readings consisting primarily of scientific journal articles. There are no tests or finals in this class.

Course Goals

The primary aim of this course is to familiarize students with current research related to the climate change with an emphasis in Southeast Alaska. Each week we will feature either a live speaker from the university or other agency or a webinar of internationally recognized scientists talking on their research be it in Alaska or elsewhere. Students will be responsible for reading a research paper related to the presentation and participating in class discussions. Also students will give a presentation on a climate change topic. The presentation will be based on a journal article(s) that will be read by the class. Alternately students may present results from their own senior thesis/research if applicable. One of the goals of the Environmental Science Program is to involve undergraduates in scientific research as part of their degree program. This class is meant to provide students with an overview of current research areas that have the potential to provide them with research experiences through internships and research assistantships.

GRADING:

Class Presentation	25% Class presentation and discussion about a climate change topic.
Class Participation and Discussion	25% Each week one student will introduce our guest speaker and facilitate a discussion on their presentation and a related research paper
Weekly Write-ups	50% Each week students will write a 1 page response to the research paper assigned for that week

Means of Assessment

Write-ups, presentation, class participation and discussion will be used to assess achievement in this course. Student competencies emphasized in this course include communication: writing, speaking, reading and listening; information literacy including researching and analyzing content; quantitative skills, critical thinking, professional behavior, and competency in computer usage.

Grades:

Letter grades are based on the following scale**:**

90 – 100%	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
0 - 59 %	F

Plusses and minuses will be given at the discretion of the instructor. Any late work will be docked 10% and if more than 1 week late 15%.

UAS Online https://online.uas.alaska.edu/online
Announcements and links to required reading articles and assignments will be posted on the course website and students are expected to monitor updates. Grades will be posted to the gradebook. The student rating questionnaire will be available during the last three weeks of the course, and students are highly encouraged to provide feedback to improve this course.

Plagiarism
Plagiarism will not be tolerated in this class. If you have any question about what constitutes plagiarism, please talk to me or look at the references available through the Egan Library website: http://www.uas.alaska.edu/library/students/index.html
(See the plagiarism prevention resources at the bottom of the page).